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NOTES OF THREE CASES OF PROGRESSIVE ASTIG-
MATISM.

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In astigmatism due to corneal asymmetry of traumatic origin changes in the amount of the optical defect are not infrequently observed. It has been commonly held, however, that in the ordinary form of so-called congenital astigmatism no such change occurs, but that, however markedly the refraction of the eye may change in other respects, the degree of astigmatism remains always the same. The following cases, which doubtless would furnish more conclusive evidence had a mydriatic been used at each examination, show that this rule is, at least, not without exceptions:

CASE I.—Mr. G. P. was 18 years old when I first examined his eyes, in March, 1872. Atropia was used and a high grade of hypermetropia, with astigmatism, was discovered. The following glasses, which corrected the total hypermetropia, as well as the astigmatism, were prescribed:

L. Eye, $+ \frac{1}{2} s \bigcirc + \frac{1}{2} c$, axis 90° .

R. Eye, $+ \frac{1}{2} s \bigcirc + \frac{1}{2} c$, axis 100° .

1. A paper read before the American Ophthalmological Society, July 15, 1885.

With these R. E. had $V = \frac{20}{xx}$; L. E. $V = \frac{20}{Lxx}$; the retina in the left eye probably being defective.

Five years later, in 1877, the patient reported again, saying that his glasses had not of late given him as perfect vision as formerly. With his old glasses V of R. E. was now only $\frac{20}{xxx}$, and the test lines did not appear alike; V. of L. E. was about as before. Atropia was not used, but a careful test showed that a $+\frac{1}{6}$ c was required for each eye, instead of the $+\frac{1}{20}$ c previously given. This change brought V of R. E. to $\frac{20}{xx}$ again, and improved somewhat that of L. E.

Four years after this, in 1881 (the patient in the mean time having had an attack of syphilitic iritis in his right eye, from which, however, he had made a good recovery), a further increase in the strength of the cylinders to $+\frac{1}{4}$ was found to be necessary, as well as a change in the L. E. from $+\frac{1}{9}$ s to $+\frac{1}{7}$ s. These changes brought up the V of the R. E., which had again declined, to $\frac{20}{xx}$, with test lines all distinct, and that of the L. E. to $\frac{20}{L}$ (?)

After an interval of three years more, V of each eye had again declined enough to cause inconvenience, and a further change of the lens to:

L. E. $+\frac{1}{7}$ s \odot $+\frac{1}{3}$ c, axis 90° .

R. E. $+\frac{1}{10}$ s \odot $+\frac{1}{3}$ c, axis 100° ,

was found to be necessary. During the twelve years which intervened between the first and last examinations, the astigmatism had increased from $\frac{1}{20}$ to $\frac{1}{3}$, a change so great as to be scarcely explicable, except upon the supposition that there had been an increase of the corneal asymmetry.

CASE II—Mr. R. D., *set.* 34, has depended upon the sight of his myopic and astigmatic right eye for some years, as extensive pathological changes about the yellow spot in his left eye have reduced its vision almost to nothing. In October, 1869, Dr. Russell Murdoch, whose skill in the determination of errors of refraction stands especially high, examined his eyes (without atropia), and prescribed the following glasses:

L. E. plain glass,

R. E. $-\frac{1}{10}$ s \odot $-\frac{1}{6}$ c, axis 180°

Nine years afterwards, in 1878, Dr. Samuel L. Frank, after

a careful examination, found that the R. E. required $-\frac{1}{2} s \subset -\frac{1}{12} c$, axis 10° ; and four years later, in 1882, he changed this for $-\frac{1}{11} s \subset -\frac{1}{11} c$, axis 180° .

In August, 1884, these glasses were still being worn, but with them there was $V = \frac{20}{xxx}$ (?) only, and the test lines were not seen alike. I found that the R. E. required $-\frac{1}{8} s \subset -\frac{1}{16} c$, to $-\frac{1}{9} c$, axis 175° , which improved V to $\frac{20}{xx}$ (?); but as he was satisfied with the sight which his old glasses gave him, no change was made at the time. In May of the present year (1885), however, he reported again, complaining of recent asthenopia. With the same glasses which he was wearing at his previous visit his V now was only $= \frac{20}{lxx}$ and one letter of $\frac{20}{L}$. He now preferred $-\frac{1}{11} s \subset -\frac{1}{8} c$, which gave him $V = \frac{20}{xx}$ (?), and made the test lines equal. Thinking it best, however, to paralyze the accommodation before prescribing a glass for him, I ordered a four grain solution of duboisia, and repeated the examination after it had been applied three times, the first application having been made the evening before. The result obtained was the same as I had gotten without the duboisia:

R. E. with $-\frac{1}{11} s \subset -\frac{1}{8} c$, axis 175° , $V = \frac{20}{xx}$ (?) and lines alike with $-\frac{1}{9} c$, however, the result was nearly as good, so that I subsequently prescribed for distant vision $-\frac{1}{8} s \subset -\frac{1}{9} c$, axis 175° . With $-\frac{1}{16} c$, (which I had determined to prescribe in August, 1884), the effect was now so poor that it was no longer to be thought of. Here, then, we have a record extending over nearly sixteen years, during which time an astigmatism of $\frac{1}{16}$ exactly doubled itself, becoming $\frac{1}{8}$.

CASE III—Dr. E., then twenty-five years of age, consulted me in June, 1880, on account of imperfect vision. With each eye he could make out only $\frac{20}{L}$ (?), with some letters of $\frac{20}{XL}$. A careful examination (without atropia, however,) showed simple myopic astigmatism in each eye, and I prescribed for him, to be set in spectacle frames, and worn constantly:

L. E. $-\frac{1}{24} c$, axis 180° .

R. E. $-\frac{1}{36} c$, axis 180° .

With these each eye had $V = \frac{20}{xx}$, and saw the test lines all alike.

In November, 1884, he reported that for some time his glasses had not been as satisfactory as they formerly were, and com-

plained especially of his near vision. I found that he was wearing his glasses much tilted forward, so as to increase the optical value of the cylinders, and with them in this position he was able to make out $\frac{20}{xxx}$ with each eye. With the lenses placed vertically he could only make out $\frac{20}{x}$, and, without glasses, $\frac{20}{cc}$. It was not convenient to use atropia in his case, but a very satisfactory examination without it resulted in glasses for constant wear being prescribed, as follows:

L. E. $+ \frac{1}{36} s \bigcirc - \frac{1}{12} c$, axis 180° .

R. E. $+ \frac{1}{12} s \bigcirc - \frac{1}{12} c$, axis 180° ,

which gave again, for each eye, $V = \frac{20}{xxx}$, but the test lines not quite perfect.

In June of the present year, he reported that his new glasses had been very satisfactory, and he desired me to order a duplicate pair for him. I found, however, that with each eye a number stronger cylinder gave a better result, making the lines exactly alike, and the letters more distinct. I, therefore, prescribed,

L. E. $+ \frac{1}{12} s \bigcirc - \frac{1}{12} c$, axis 180° .

R. E. $+ \frac{1}{12} s \bigcirc - \frac{1}{12} c$, axis 180° ,

which gave for the two eyes $V = \frac{20}{xvi}$ (?).

It is to be regretted that in each of these cases all the tests were not made with the eyes under the influence of a mydriatic, as the results obtained would then, doubtless, be more likely to carry conviction to the minds of those disposed to be skeptical concerning the progression of astigmatism. My experience leads me to believe, however, that had this been done, the results would not have been materially different. Such cases are, probably, not of frequent occurrence¹; but, if they happen never so rarely, it is of practical importance that this fact should not escape recognition.

If, as seems probable, the increase of astigmatism is due to an alteration in the curvature of the cornea, we should expect to meet with this phenomenon more frequently in the yielding myopic than in the relatively stable hypermetropic eye.

1. I have the notes of several other cases, less striking than those I have related, and Dr. Russell Murdoch tells me of several which he has met with, in one of which he observed an astigmatism change, during a period of nine years, from $\frac{1}{48}$ to $\frac{1}{24}$.

ON THE PULSATING VARIATION OF INTRA-OCULAR TENSION AS MEASURED BY THE MANOMETER.¹

BY DR. LUCIEN HOWE, BUFFALO, N. Y.

The object of this communication is mainly to call attention to an observation proving that retinal venous pulsation is accompanied by a corresponding variation in intra-ocular tension. As this is measured by means of a special instrument, it will be necessary first to devote a few moments to the consideration of the manometer in general, and especially to the form used in the experiments referred to. It is unnecessary to consider the many variations of this instrument, or the different results obtained by earlier investigators. It is sufficient to say that when this line of study was first pursued by Gruenhagen, Adamuek and others, nearly twenty years ago, the instruments used were exceedingly imperfect. They consisted principally of a single U-shaped tube partly filled with mercury, or some fluid, connected at one extremity by means of a flexible tube to a trocar which entered the anterior chamber of the eye. These were evidently imperfect for the reason that as soon as the connection between the instrument and the eye was made, the pressure within the eye forced a certain amount of the aqueous humor out through the trocar into the tube, and at once the intra-ocular tension became abnormal. In order to keep it at as near a natural point as possible, it was then necessary to pour into the distal arm of the manometer either mercury or some other substance, which, exerting a pressure there, would force back the aqueous humor into the anterior chamber and thus re-establish at least the natural tension of the globe. Such an appliance was not only inaccurate but evidently difficult to manage, and it is hardly to be wondered that the early experiments in manometry gave very contradictory results. This, however, was

1. Read at the meeting of the American Ophthalmological Society, July 16, 1885.

the principle in general employed, not only by the two investigators mentioned, but by many of those who followed. It is only recently that a modification of the instrument has been made which bids fair to place this class of experiments upon a substantial foundation. The improvement consists principally in making the manometer a double one, and was suggested in an article which appeared in the *Archiv fuer Ophthalmologie*, volume 29, by Dr. Holzke. In his experiments in the Physiological Institute at Erlangen, he was associated with Dr. Ernst Graser, and the latter has also published a digest of their work together, in the *Archiv fuer Experimentelle Pathologie and Pharmakologie* of September, 1883.

The double manometer referred to deserves a little special consideration. It consists, virtually, of two U-shaped tubes, having their adjacent arms united, and at the point of junction communicates with a single upright tube which can be closed with a clamp attached to a piece of rubber tubing. Each lower curve of the entire instrument is filled about half full with mercury, and the part which joins the two, as also the single arm and the tube leading from the manometer to the trocar, is filled with water. The trocar itself, as used by the gentlemen referred to, was of peculiar construction. This I will refer to later. In the detail of filling the instrument considerable care is necessary, to which it is unnecessary to refer at present. I would simply say that it is essential that all air bubbles be excluded, and then, by lifting the trocar above the level of the open tube at the junction of the two adjacent arms, the water of course rises and tends to flow over. If a clamp which tightens with a screw is then adjusted at this point, not only is air prevented from entering the instrument, but also by means of this screw complete control is had upon the pressure exerted on the column of water and mercury combined. It is upon this fact of being able to control the pressure by means of such a screw that the virtue of the instrument depends, for if the trocar is made to enter the anterior chamber of an animal's eye there would be a natural tendency for the aqueous humor to flow out in the direction of the manometer, but this can be easily controlled by means of the screw in the clamp referred to, and to such a de-

gree that the column of mercury, in the arm of the manometer nearest the animal, can be always kept at exactly the same point in the graduated scale placed upon it, for the purpose of reading off the exact position of the mercury. The pressure exerted by the screw upon the column of water and mercury combined is thus shown, not in any change of the position of the column nearest the animal, but is transmitted over to the other side of the manometer, and shows itself in the farthest part of the column of mercury. In other words, in this way it becomes necessary to take out or add to the quantity of mercury, but by changing the pressure exerted by the screw this may be increased or diminished as is desired. So much for the different forms of the manometers and the advantage of the double manometer as compared with the others.

A word should be said concerning the trocar. Graser and Holzke lay considerable stress upon the details of its mechanism. I, at first, obtained one from the instrument maker recommended by them, but found that its disadvantages were very great. It is rather complicated. It consists of a conical needle with an exceedingly small opening on one side which is closed by a piston-like arrangement connected with the trocar. The advantages of this I was unable to find; but, on the contrary, soon discovered that it was exceedingly liable to get out of order and difficult to manipulate. Accordingly I used simply the needle of a hypodermic syringe which had an opening of considerable size on one side but was closed at the point, and at the other extremity was connected with a simple stop-cock, such as is common in every water pipe. This served the purpose much better than the one described. The animals used in the experiments were cats and rabbits, but it soon became evident that cats were much better adapted to the purpose, because of the greater depth of the anterior chamber. It has seemed advisable to enter into the detail in order that the observations concerning the variation of intra-ocular tension may be made more clear, while at the same time I would call attention to the improvements in the instrument and to the simple modification of the trocar just mentioned. It is proper, therefore, to pass now to the consideration of this variation.

I must say at once that the existence of such a pulsating variation of the tension was noticed among the very first who attempted any experiments in this direction. This I have also observed. In addition, however, I wish to call attention to the fact:

First. That this variation of tension is a measure of the retinal venous pulse.

Second. That, as such, it settles the question as to the cause of the venous pulse, and,

Third. That the duration may be varied by varying the external pressure.

In regard to the first point, when this pulsating variation is shown in the manometer it is possible to recognize with the ophthalmoscope a corresponding pulsation in the venous circulation on the anterior of the globe. This is an observation of prime importance in this connection, but more than once have I failed to obtain any view of the interior of the animal's eye with a trocar at the same time in the anterior chamber. The distorted cornea makes it almost impossible to use the ophthalmoscope with any degree of satisfaction. I have several times been successful, however, in obtaining a good view of the vessels of the fundus, at the same time that pulsating variation was being recorded by the manometer, and found that variation of the intra-ocular tension indicated simply the pulsation on the anterior of the globe or the reverse. In other words, if the same conditions exist in the human subject as in the animal, it is safe to assert that pulsation of any kind on the interior of the globe is also accompanied by a variation of the intra-ocular tension—too slight, of course, to be recognized by the touch or any clinical method of measurement. The observation would also seem to be of interest in determining the question as to the cause of the retinal venous pulse and showing the truth of Donders' theory concerning it. His explanation was as follows: When the heart contracts, the small arteries supply an unusual amount of blood to the interior of the globe and momentarily increase the intra-ocular tension, and this also produces a damming back of the blood in them. Immediately, however, the sclera contracts as it were, and forcing the blood out of the overfilled

veins empties the globe to its previous condition. This seemed a rational explanation. But, on the other hand, such good observers as Coccius, Berthold and Jaeger contended against the theory, asserting with truth that there were then no observations to prove it. On the contrary, it seemed to them the sclera was too unresisting to yield to the small amount of blood thus pumped into it.

When Leber wrote his article for Graefe and Saemisch's *Handbuch*, he simply gave the various opinions as to there being any relation between intra-ocular pressure and pulsation, saying: "For the exact determination of the question experiments are yet to be made." It seems to me that the operations referred to tend to settle the validity of Donders' explanation.

Next I would mention a peculiarity in the duration of the pulsation which does not seem to be generally spoken of. When the trocar is made to enter the anterior chamber and the connection between the aqueous humor and the manometer once established, for a few moments the variation in the rise and fall of the mercurial column is very apparent, and if the hand be placed upon the heart of the animal it will be found that the two are synchronous. I was early struck by the fact that this variation in the tension continued but a very short time. At first I supposed that the connection between the trocar and the anterior chamber had by some accident been obstructed, but pressure of the finger on the globe showed that it was open, the actual fact being that the eye had accommodated itself to the circumstances. Moreover, this pulsating variation after having once ceased can be again initiated by pressure of the finger upon the globe. The second time it lasts a shorter time than the first, and the third time is again of still shorter duration. This variation is apparent from the readings of the manometer.

It seemed worth while to call attention to these three facts in connection with manometry and at the same time to mention the apparatus referred to. I may add, however, that the study was begun with the intention rather of measuring the effect of mydriatics and myotics upon the intra-ocular tension. Concerning this, the data are not yet complete. Any reference to the subject would, however, be incomplete without an expression of

thanks to my friend, Professor Zunzt, of Berlin, in whose laboratory these experiments were made, and to whom I am indebted for valuable suggestions concerning them.

THE AMERICAN OPHTHALMOLOGICAL SOCIETY.

The 21st annual meeting of the Society was held at New London, Conn., July 15 and 16, 1885, the sessions being held in the parlor of the Pequot House. The President, Dr. William F. Norris, of Philadelphia, in the chair.

Dr. C. R. Agnew, New York, read the first paper, which was entitled "Operation for the Removal of the Dislocated Crystalline Lens."

The operation for the removal was as follows:

The pupil was dilated with atropia. The patient was then etherized and cocaine was applied. The eye was secured with fixation forceps. A new instrument, resembling a two pronged fork which was termed a bident, was introduced into the vitreous chamber behind the dislocated lens, pressing it forward. The bident transfixed the eye and held the lens in position. Section was then made in the ordinary manner and the lens removed. The eye was dressed with absorbent cotton and a black silk bandage. Antiseptic solutions were used and a four per cent. solution of cocaine was applied twice a day. The eye recovered without any unpleasant symptoms. The ophthalmoscope revealed atrophy of the choroid and retina. The speaker did not claim that all dislocated lenses should be removed, but this instrument facilitated the operation when it was required.

Dr. David Webster, New York, related a case of extraction of a dislocated lens by Dr. C. R. Agnew's bident.

The patient received a blow on the right eye. This was immediately followed by loss of sight. Examination showed that the lens was dislocated. No treatment was recommended at that time. Some months later, pain suddenly appeared in the injured eye. The lens was found to be cataractous and incarcerated in the pupil. Cocaine was applied, but did not relieve the pain. Atropia relieved the pain. Later the lens be-

came loose and was found in the vitreous. The tension was normal. It was decided to remove the lens. The bident was passed back of the lens, pressing it forwards. The incision in the cornea was then made and the lens removed with a spoon. The eye was dressed with absorbent cotton and recovered without complication. V $\frac{2}{c}$ with $+\frac{1}{3}$ s.

With the bident many eyes may be saved if the lens can be brought in sight. There is not danger from injury of the ciliary body.

Dr. H. Knapp thought that in these cases there was not much difficulty in removing the lens which could often be accomplished with the loss of very little vitreous, but the danger came in afterwards from inflammatory complications, and where the sight was lost, he thought it better to at once enucleate the eye and thus lessen the danger of inflammation. He considered the bident, which was exhibited, to be an ingenious instrument. For the last six or eight years he had not introduced an instrument within the globe to facilitate the removal of the lens. This he was able to accomplish by external manipulation.

Dr. Williams, of Cincinnati, considered the instrument an ingenious and useful one, but in the cases reported he agreed with Dr. Knapp that enucleation was the best procedure.

Dr. C. R. Agnew thought that the bident might also be useful in the removal of foreign bodies from the interior of the eye. He did not acquiesce in the view that enucleation was a simple operation. He regarded it as a serious mutilation.

Dr. C. H. Williams, Boston, thought that there was another alternative than those mentioned, and that was evisceration of the eye, the removal of its contents and closure of the anterior opening with sutures. This he had performed a number of times with success. He thought it better than enucleation. It gives a better stump for the artificial eye.

"Extraction of the Lens in its Capsule," by Dr. B. St. John Roosa, New York.

For the past three years the doctor had been in the habit of removing the lens in its capsule, in a large proportion of cases without iridectomy. The use of cocaine has facilitated the operation. He referred particularly to the method of dislocating

the lens. The section is made, as usual, but large. After puncture and counter-puncture are made, the knife is turned on its back so that it rests on the iris. The knife is then moved up and down two or three times until the lens is seen to move. Then the section is completed and then the lens can usually be removed with no loss of vitreous. The manipulations on the cornea are made with one or twospoons. Sometimes after the operation the iris is rolled under, but in many cases the pupil is circular. The writer has performed the operation between thirty and forty times and is satisfied with his success. If the lens is not dislocated, iridectomy may be performed and the ordinary operation practiced. A paper on the subject is to be found in the transactions of the *New York State Society* and in the *Medical Record* for February, 1885.

Dr. George C. Harlan, Philadelphia, reported "two cases of sub-conjunctival luxation of the lens."

In the first case no operation was recommended, as vision was good. In the second the lens was removed. The doctor thought it well, in those exceptional cases in which vision remains, that the operator should think twice before resorting to removal.

Dr. O. F. Wadsworth, of Boston, reported a case of "dislocation of the lens under Tenon's capsule."

The eye had been injured two weeks before the patient came under observation. There was loss of sight, pain about the eye and irritation of the other eye. The cornea was hazy and there was blood in the anterior chamber. The eye was enucleated, and it was found that the lens was beneath Tenon's capsule, and that it was held in this position by inflammatory tissue.

"Treatment of Purulent Conjunctivitis," by Dr. J. A. Andrews, New York.

The treatment is based upon the belief that the contagious element is the micrococcus variety. He related a case in which he had secured an inoculation of the seventh generation of a pure culture of a gonococcus.

This is the first case successfully inoculated with the gonococcus. He showed an instrument which he had devised to wash out the conjunctival cul de sac. It consisted of an eye speculum with

hollow arms through which fluid may be passed. He had found bichloride of mercury solution (1 to 1,000) serviceable, but apt to irritate. A six per cent. solution of boracic acid was also found efficient. A two per cent. solution of carbolic acid is useful, as it inhibits the movements of the white corpuscles. Irrigation should be maintained for ten minutes in order to remove all secretion. Nitrate of silver solution (2 to 12 per cent.) is then used and an antiseptic dressing is next applied. This consists of vaseline and boracic acid or carbolic acid; but he laid especial stress upon the importance of maintaining irrigation of the conjunctiva by means of the instrument referred to above.

"Abscess of both Frontal Sinuses," by Charles S. Bull, of New York.

The patient had been hit on the forehead fourteen years previously with a piece of wood. This produced a fracture of both nasal bones and deviation of the septum. In seven weeks the wound had closed. Ten years after the accident a swelling was noted at the upper inner angle of the right orbit which could be made to disappear by pressure. There was complete ptosis. An incision was made into the swelling just beneath the orbital margin and a large quantity of pus escaped (two to three ounces). The cavity was washed with a five per cent. solution of carbolic acid. No connection with the superior nasal meatus could be detected, but the bony septum between the two frontal sinuses was absorbed and both sinuses were converted into large cavities. The entire ethmoid bone was an immense cavity, the bony structure being absorbed. A number of osteophytes were removed. A drainage tube was introduced. The patient was discharged six weeks after the operation and recovered completely. The ptosis disappeared and the eye was restored to the normal plane.

Dr. Knapp recommended the substitution of a silver tube for the rubber drainage tube usually employed.

"A case of Melanotic Sarcoma of the Orbit" was reported by Dr. Buller, of Montreal, Canada. (See this Journal, page 118, Nos. 5 and 6.)

"Bony Tumor of Orbit," by Dr. B.E. Fryer, Kansas City, Mo.

The patient, a boy six years of age, came under observation April, 1885. There was swelling of left orbit which included the whole line of the superciliary ridge. It was quite hard. Some time before the boy had been struck by a piece of wood, but it was thought that no splinter had become lodged beneath the skin. It was decided to remove the tumor. This was done, and on examination it proved to be a bony cyst within which was a small piece of wood. This was enclosed in bone on all sides. The edges of the wound were brought together and healing resulted without complication.

Dr. W. H. Carmalt, New Haven, Conn., reported the case of a child of ten years of age from whom he removed a small growth from the upper lid. Six weeks later the growth had returned. An exploratory operation was done and it was found that the growth extended into the orbit and that it was impossible to remove it entirely. It was therefore decided not to complete the operation. The child has since died. The tumor proved to be a rapidly growing sarcoma. He thought that if in young children the tumor appears to be quickly recurrent and not easily isolated, that no operative interference should be attempted.

Dr. Kipp, Newark, thought that in many cases these tumors of the orbit are not primary but secondary, and that the primary tumor may be in such a position as not to attract attention.

Dr. Harlan, Philadelphia, reported several instances of inflammatory exudations in the orbit simulating tumors and illustrating the importance of exercising great care in diagnosis.

Dr. W. S. Dennett, New York, exhibited a new series of test letters.

Dr. Norris, Philadelphia, presented a new sheet of metric test letters, devised by Dr. Oliver of Philadelphia.

Dr. C. R. Agnew, New York, made a brief reference to a case of occasional or simulated blindness in which the vision suddenly returned.

Dr. Theobald described a similar case in which there was sudden blindness. The ophthalmoscope showed no change in the fundus and the pupils acted normally. A favorable prognosis was given and the patient recovered sight in a short time.

Dr. Buller, Canada, thought that these cases could not be properly termed entirely imaginary. He thought there was for the time being a functional loss of power in the nerve. He referred to a case in which there was hysterical blindness and deafness associated with loss of sensation in the skin covering the mastoid region. On one occasion he applied to the anæsthetic surface an iron sufficiently hot to raise a blister. This was done without the patient's knowledge and unexpectedly. But it did not cause her to wince.

Dr. Roosa had been led to believe from his experience that in these cases there is a basis for the blindness in the ocular condition. There is a derangement of sight from some condition and the patient finally imagines that she is blind.

Dr. Harlan, Philadelphia, thought that there were two classes, one in which there is purely deception, perhaps the result of deranged mental condition, and the second in which there is a real temporary suspension of function.

Dr. Risley, Philadelphia, thought that some of these cases might be explained by an enfeebled condition of the circulation in which the heart was unable to force the blood against the normal intra-ocular tension, and the loss of vision thus would result from want of nourishment of the retina.

Other cases of hysterical blindness were described by Dr. Williams of Cincinnati, and Dr. Andrews of New York.

"Some of the Results Obtained in the Compilation of 1000 Cases of Refraction," by Dr. E. E. Holt, Portland, Maine.

The writer had been in the habit of recording all the measurements connected with the prescribing of glasses. As a result he had found in 1000 cases thus recorded the average distance between the centres of the pupils of the human eye to be about 60 m. m. The average of other measurements were given, and the importance of the physician determining and designating them and then seeing that they were carried was dwelt upon.

"Rapidly Progressive Myopia Checked by Section of the External Rectus," by Dr. G. C. Harlan, Philadelphia. The case was that of a boy of sixteen in whom myopia was progressing rapidly. The external rectus was divided seven years ago. The internal rectus was also excised by the use of prisms. Since then there has been no increase of the myopia.

"Three Cases of Progressive Astigmatism," by Samuel Theobald, Baltimore. (See this number, page 133.)

Astigmatism of traumatic origin, he remarked, is observed not infrequently to undergo changes in degree, but it has been commonly held that congenital astigmatism does not alter in degree, though the refraction of the eye as a whole may undergo marked change. The cases which he reported, he thought, proved that there were some exceptions to this rule.

The first case was that of a young man who with a high grade of hypermetropia had an astigmatism of each eye which required for correction, a $+ \frac{1}{20}$ c. The case was observed at intervals during a period of twelve years, and during that time the astigmatism increased until finally a $+ \frac{1}{13}$ c was needed to correct it.

The second case was one of compound myopic astigmatism in a young man in which there occurred, along with an increase of the myopia, a growth of the astigmatism, during a period of sixteen years from $\frac{1}{8}$ to $\frac{1}{2}$.

In the third case a simple myopic astigmatism in a physician twenty-five years requiring a $\frac{1}{4}$ c in one eye and a $\frac{1}{30}$ c in the other for its correction, changed in five years so that a $\frac{1}{11}$ c and a $\frac{1}{3}$ c respectively, were needed.

The speaker regretted that the examinations had not all been conducted under a mydriatic, as they would then be more apt to carry conviction to the minds of those disposed to be sceptical regarding the progress of astigmatism. He did not believe that the result would have been different. Such cases are not frequent, but it is important that the fact should be recognized. As the increase of astigmatism is probably due to change in the corneal curvature, the phenomenon should be met with more frequently in the yielding myopic than in the relatively stable hypermetropic eye.

AFTERNOON SESSION.

"Hypermetropic Refraction Passing over into Myopic Refraction," by Dr. S. D. Risley, Philadelphia.

The doctor had on previous occasions called attention to five cases of a similar kind, and the object of his paper to-day was

simply to report seven additional cases seen within the past year.

Dr. W. S. Dennett, New York, made a few remarks on the importance of the examination of spectacles. He exhibited a series of drawings showing the effect of different kinds of lenses on straight lines.

He also exhibited an electric light ophthalmoscope, a description of which has been printed in the *New York Medical Record*.

An arrangement for the demonstration of refraction and accommodation was exhibited by Dr. Howe, of Buffalo, N. Y.

This consists of two bands of thin metals bent in such a manner as to represent the outlines of a double convex lens and passing through it are two jointed rods representing the rays of light ordinarily figured as passing through such a lens and joining at its focus. The flexible bands were attached to each other above and below, so that by approaching or separating the sides, they could be made to show less or greater convexity. The rods representing the rays of light were jointed near the centre in such a way that, while the two halves could be placed in such a direction as to show the light as entering parallel to the axis of the lens, the other two portions could be bent to a point to show the convergence of rays at the focus. By alteration in the position of these rods and also in the focus of the bands representing the lens all the different variations of the laws of refraction and the changes in accommodation can be demonstrated to a class of students.

Dr. E. Dyer, Newport, R. I., demonstrated the perimeter which he had described at the last meeting of the society.

"Two Cases of Unilateral Temporal Hemianopia," by Dr. R. S. Bull, New York.

The first case was that of a man aged 60, first seen in 1884. In 1880 he had received an injury which rendered him unconscious. When he regained consciousness he found that he was blind in the right eye. In 1883 he noticed a central obscuration of vision in the left eye. There was no syphilis, no disease of the heart and no indication of Bright's disease. He had never used alcohol to excess, but smoked and chewed tobacco in large amounts. There was an irregular central scotoma. The media were trans-

parent and the iris normal. Both optic discs were of a dirty white color and in both there was a deep excavation with pulsating veins and in the left eye there was a large retinal haemorrhage. The tension was normal.

The second case occurred in a man aged 60. He had been knocked down by a horse, receiving a depressed fracture of the frontal bone above the left eye. The patient was unconscious or delirious for four weeks following the accident. When he regained consciousness he found that the left eye was blind. Examination showed that in the left eye there was somewhat irregular temporal hemianopia. This may have resulted from fracture of the superior orbital plate, with injury to the fibres of the optic nerve going to the temporal half of the retina.

"Two Cases of Penetration of the Eyeball with Scissors in the Operation of Strabismus," read by Dr. H. Derby, Boston.

The first case was that of a young man on whom an operation for strabismus had been attempted. The surgeon inadvertently picked up a pair of sharp pointed scissors. The point of the scissors suddenly penetrated the eyeball and a portion of vitreous equal in size to a cherry stone escaped. The operation was abandoned and Dr. Derby was called to see the case. The eye was bandaged and the patient put to bed. Several attacks of inflammation supervened, but the patient was discharged on the forty-first day with $V = \frac{7}{10}$.

In the second case the scissors also entered the sclerotic, but after a somewhat tedious convalescence the wound was found closed on the twenty-first day with vision as good as before the operation.

Dr. Knapp stated that he had done three thousand squint operations and in three cases he had punctured the sclerotic. He however completed the division of the muscle and the patient recovered as readily as from an uncomplicated operation.

Dr. Mittendorf stated that he had been present at a strabismus operation where the sclera was opened. He advised the surgeon to complete the operation. This was done and the wound had healed in four or five days. He thought that in case the accident happened that the division of the muscles should be completed.

Dr. E. Williams, Cincinnati, reported a case in which he had punctured the eye. The patient recovered without difficulty.

"Strabismus, Its Correction When Excessive and in High Degrees of Amblyopia," by Dr. E. E. Holt, Portland, Me.

The writer had employed advancement of the weakened attenuated muscle in connection with tenotomy, in certain cases of squint, and after tenotomy alone had failed to correct the deviation. He also exhibited an apparatus he had devised for showing the associated and accommodative movements of the eyes and the effects of tenotomy and advancement of the muscle in correcting squint.

Dr. Kipp at one time employed advancement, but he had given it up because it was difficult to graduate the result.

"The Treatment of Strabismus Internus," by Dr. W. W. Seely, Cincinnati.

He said that each year with its added experience had strengthened the conviction that early operations (up to the tenth or fifteenth year) are questionable and possibly should be entirely abandoned. He combated the idea that crossed eyes never become straight without an operation. Nothing is better established than the relation between ametropia and strabismus. And all recognize the necessity for glasses to prevent the recurrence of the squint after tenotomy. Every one knows that it is possible to correct the squint by setting aside the ametropia by means of glasses.

He said, my early conviction that something should be left to time and glasses has long since grown into an absolute law of action, for I have become thoroughly persuaded that immediate perfection meant later in life insufficiency or even divergence.

Operative procedures should not be the first consideration, but should be looked on as an adjuvant to be resorted to later on, if necessary.

He summed up as follows:

1. That with our present light routine operative interference is wrong.

2. That to thoroughly correct the deviation in young children by operative interference is extremely liable to subject them in after life to insufficiency or external squint.

3. That a later period of life if anything favors better results from operative interference.

Dr. Knapp thought advancement a dangerous operation. Had always been able to correct the deviation by two or three tenotomies and if necessary stitching the eye to the commisure.

Dr. Theobald, Baltimore, endorsed Dr. Knapp's view in reference to advancement.

He was surprised at the conclusions of Dr. Seely. Squint operations in his hands had been very satisfactory. If postponed they are likely to prove unsatisfactory on account of the amblyopia which is liable to develop.

Dr. O. F. Wadsworth had studied the subject for a long time and had convinced himself that amblyopia from squint did not occur. The ability of the patient to use the vision which he has does seem to be lost by a continuance of the squint, but it may be recovered by practice. If the examination of vision was carefully made he was certain that it would be found that the vision was not improved after the operation. It however is often difficult to get the full amount of vision which a squint eye possesses.

"Ectropion of Both Lids; Blepharoplasty by the Italian Method," by Dr. R. H. Derby, New York.

The displacement of the lids was the result of cicatricial tissue from a severe and extensive burn of the face. The lids were loosened from these attachments and the new lids formed from flaps raised from the arm. The arm was bound to the head with water-glass plaster and the pedicle was not divided until union had taken place.

Photographs were exhibited showing the appearance of the patient before and after the operation.

Dr. Hasket Derby exhibited a box of trial lenses made by Nachet in which the following features were embodied:

1. The doubling of the prisms.
2. The distinguishing of the cylindrical lenses by coloring the positive setting black and the negative red.
3. The adaptation of the trial frames to receive the glasses without removal from the patient's head.
4. The removal of the handles from the prisms and cylinders.

Plastic Operations Without Pedicles, by Dr. B. Joy Jeffries, Boston.

The object of the paper was to make one or two suggestions which the author had not yet put in practice, but which he was ready to try when opportunity offered. He suggested the use of the prepuce from the circumcision of Jewish children for operation about the eyes. He also suggested that in plastic operations the desired result might be obtained without the use of a flap by employing carbolized oil dressing to retard healing, for it is well known that some time after a plastic operation the transplanted tissue has almost entirely disappeared.

EVENING SESSION.

Dr. Harlan, Philadelphia, reported two cases of congenital paresis of the external rectus. Dr. Harlan also exhibited and described Borek's sphero-cylindrical lenses.

"The Removal of a Bit of Steel From the Lens with the Electric Magnet," by Dr. J. L. Minor, New York.

M. S. was struck one week before coming under observation by a piece of steel. There was a small scar in the cornea and vision was much reduced. There was clearly a piece of steel in the lens, which the doctor desired to remove at once. After consultation it was thought advisable to await the development of some symptoms. The patient was therefore given atropine and instructed to return if the eye gave any trouble. Some time later the eye became irritable, there was considerable ciliary injection; there was haziness and the tension was increased. Cocaine was employed and iridectomy performed. The shank of a strabismus hook was attached to an electro-magnet thus making it a magnet. The extremity of the hook was then carried into the lens and the piece of steel at once attached itself to it and was removed. Thirteen days later the eye had recovered from the operation. The lens has not been removed.

"Malformation of the Upper Lid," by Dr. H. Derby, New York.

In this case there was a fissure of the upper lid from the angle of which a portion of skin projected in a peculiar manner.

"Removal of Epithelioma of the Eyelid by Application of Benzole and Calomel," by Dr. A. Matthewson, Brooklyn

O. D., laborer, fifty years of age, was seen October 30, 1881, with tumor on right lower lid. This first appeared as a warty growth three years previously. Of late it had been rapidly growing and presented a raw granulation surface. Careful examination by an expert showed it to be undoubted epithelioma. It was treated by frequent dustings of calomel, after brushing the surface with benzole. The tumor entirely disappeared until a few months ago when a granular spot appeared at one edge of the site of the former growth. This disappeared under a renewal of the same treatment.

Lipomatous Ptosis, by Dr. H. Schell, Philadelphia.

Under this head the speaker reported four cases of ptosis from excessive accumulation of fat in the upper lid. The condition occurred in young women between the ages of 18 and 25. The deformity was symmetrical, the weight of the lid causing it to cover one-half of the cornea. Excessive fat was removed through a horizontal incision. The smallest amount taken away was thirty-five grains, the largest seventy-one grains. The levator regained power in from one to four weeks. In one case it was necessary to repeat the operation.

Clinical Observations, by Dr. L. Webster Fox, Philadelphia.

CASE I.—Congenital cataract in both eyes successfully operated on in a patient sixty years of age.

M. H., a negro, age 60, presented himself at the Germantown Hospital February 4, 1884. Congenital cataract of both eyes was found. The use of a four grain solution of atropia produced no dilatation of the pupils. There was simply light perception. Shortly afterwards the right lens was removed and the wound rapidly healed. At the end of eight days the patient could see but could not name objects without touching them. The lens of the left eye was also successfully removed. The effect of the acquisition of sight after sixty years blindness was carefully described by the doctor. The lenses when removed were found to be of a spheroidal shape. The optic nerve presented an oval outline.

CASE II.—Recovery of useful vision after eighteen years blindness.

R. L., age 37 years was injured in the left eye when three

years of age. Two years subsequently sympathetic ophthalmia developed in the right eye, resulting in qualitative perception of light only. An iridectomy was done at the Germantown Hospital in June 1884. The media were found to be clear. When admitted to day light complained of erythropsia to such an extent that dark glasses were ordered.

This disappeared in the course of three months. A + 10 D. spherical glass was ordered for distant use and a + 14 rendered near objects visible. Subsequent examination showed that better vision was obtained by a combination of spherical and cylindrical lenses.

Article III. consisted in the history and treatment of five cases of retinitis pigmentosa by electricity (constant current.)

There was marked improvement which in one case remained nine months after discontinuance of the treatment. Five cells are usually employed, the positive pole being placed over the closed eyelid and the negative pole at the nape of the neck.

"On the Pulsating Variations of Intra-Ocular Tension as measured by the Manometer," by Lucien Howe, M.D., Buffalo, New York.

In calling attention to the variations of intra-ocular tension some attention was also given to various forms of manometer or instruments for its measurement. The earlier forms consisted simply in a U-shaped tube of glass connected by a flexible tube to a trocar. When the trocar was introduced into the anterior chamber of the eye the intra-ocular pressure would tend to force the fluid through the tube and show the degree of pressure by a rise in the opposite column of the U-shaped tube. This was imperfect for the reason that when the aqueous humor escaped from the eye, it was at once in an abnormal condition. The double manometer, described by Grasser and Holzke, obviated this difficulty. In this, however, there was an imperfection in the trocar, which was rather complicated and liable to get out of order. An improvement was accordingly suggested in having a stop-cock attached to the needle of the hypodermic syringe, and this the writer found to serve the purpose much better than the other. The animal best adapted to this class of experiments is the cat on account of the deep anterior chamber.

In the earlier experiments with the manometer, it was noticed that the intra-ocular tension varied with the heart's action. In addition to this, the writer called attention to the fact that these variations in the pressure, as indicated by the manometer correspond to pulsations which can be seen with the ophthalmoscope in the vessels in the interior of the animal's eye. In other words, if the same thing holds in the human subject, we must infer that when pulsation is seen in the interior of the eye, there is also a variation of intra-ocular tension, although not enough to be detected by the touch or by an ordinary instrument. This connection between pulsation and pressure is a demonstration of the cause of venous pulse in the eye as explained by Donders. It was also observed that after the introduction of the needle there was at first considerable pulsation, but, after a short time this ceased, the eye evidently adjusting itself to the unusual condition. The experiments referred to were made in the laboratory of Prof. Zunzt, of Berlin.

Dr. H. Knapp, of New York, reported "nine successive cases in which the electro-magnet was used for the extraction of chips of iron from the interior of the eye."

These cases were operated on during the past three and a-half years. In two the chip of iron was located in the iris, in one for two days, causing inflammation, and in the other, for seventeen years, remaining quiet until recently. Both were successfully removed without deterioration of vision.

In the seven remaining cases, the foreign body was in the vitreous, had produced a cataract and could not be seen. In three cases the attempt to extract them with the magnet failed and the eyes had to be enucleated. In four cases the chips of iron were brought forth at the first, second or third introduction of the tip of the magnet. In all these four cases, the recovery was smooth. All four are still cataractous. In two the form, size and tension of the globe is not changed and the perception of light is good over the whole field. In the two others the globe is slightly smaller and softer and the field of vision defective, corresponding to the wound made for the extraction of the foreign body. There was no irritation in any of the four eyes as long as they were under observation.

"The Actual Caутery in Destructive Corneal Processes," by Dr. H. Knapp, New York.

The doctor cited a number of cases in which its use had been of service and considered it a valuable measure.

Dr. Howe had employed this measure in three cases and the corneal ulcer has been somewhat lessened.

Dr. E. Williams, Cincinnati, had, for the past fifteen years, been in the habit of treating phlyctenular ulcers of the cornea by the application of pure carbolic acid and had found it to act admirably.

Dr. O. F. Wadsworth had for several years been in the habit of using carbolic acid for serpiginous ulcers of the cornea and for sluggish, painful infiltrations of the cornea. In sluggish infiltration the application is preceded by scraping, and in some cases the simple scraping has been sufficient. When the *ulcus corneae* serpens had been severe, he did not recall that it had entirely stopped the process. In one case in which the acid was applied at the beginning of the affection, three applications checked the disease.

THURSDAY MORNING.

"Pneumophthalmos, or Air in the Vitreous Humor," by Dr. W. F. Mittendorf, New York.

The entrance of air into the interior of the eye will occur at times during an operation, as for instance a cataract extraction. In such cases the air may get into the anterior chamber, whence it can be removed with ease. It is, however, entirely different when air gets into the vitreous chamber. Fortunately this accident is of such rare occurrence that so far no description of it has been given. The writer had seen two cases of this kind within the last two years. Both occurred in connection with injuries caused by the entrance of foreign bodies into the interior of the eye. Such accidents are usually so serious that any complication of them becomes a matter of great interest. The first case was that of a young blacksmith who was wounded by a piece of iron penetrating the sclera and lodging in the vitreous humor. The foreign body, surrounded by a clot of blood, was found at the bottom of the eye. Behind the lens, and a

little above it, three air bubbles were seen by means of the ophthalmoscope; one of these appeared to be of the size of a small pea, the smallest was about as large as a grape seed. They closely resembled the air bubble as seen under the microscope, their centres being bright and the outlines well defined and surrounded by a sharp black border. Their recognition was not difficult. The foreign body could not be removed with the magnet and it was decided to allow it to remain. The eye was carefully bandaged, and the day following it was found that the air bubbles had united and thus located at the posterior pole of the lens, the patient having remained quietly on his back some time before the examination. While he was in the upright position the air began to rise slowly until it reached the upper part of the vitreous chamber. During this trip the bubble looked oval and decidedly pointed at its lower portion, resembling oil globules as they are seen ascending in water. Forty-eight hours after the accident, every trace of the air bubbles had disappeared.

The second case reported was the result of a drilling accident. A pretty large piece of stone or iron had perforated the sclera at the lower and outer part of the eye. In the semi-transparent vitreous an air bubble of the size of a hemp seed could be seen distinctly.

In order to determine the exact appearance of air in the vitreous humor, the writer experimented upon rabbits' eyes. Four of them had air introduced into the vitreous humor by means of a hypodermic syringe, and four were subjected to the introduction of oil, also by means of the hypodermic syringe. Nearly all of these experiments were successful. The difference between the air and the oil bubble was so marked that they could be readily diagnosed by means of the ophthalmoscope. The latter were more highly refractive, heavier in appearance and the contour decidedly darker than that of the air bubbles which were entirely colorless.

The conclusions reached by the author were as follows:

1. The entrance of air into the vitreous body can occur only after a part of the contents of the vitreous chamber has escaped.
2. It is favored by the entrance of a foreign body which makes a large gapping irregular wound of the sclera.

3. In order to allow air to enter the vitreous humor, this must either be quite fluid or its anatomical arrangement must have been disturbed by the entrance of a foreign body, or the air must have been attached to the foreign body and be thus carried with it into the eye.

4. The air in the vitreous humor appears like an air bubble as seen under the microscope, it is more or less round, highly refractive in the centre and has a sharply defined black outline.

5. Oil globules in the vitreous present a similar appearance, but they look heavier, are not perfectly colorless and their outlines are darker; they are also more glittering in the centre.

6. Air bubbles will be completely absorbed within two or three days; their presence is not a source of great danger to the eye. Oil globules last longer, but they are likewise non-irritating.

"A Case of Tubercle of the Iris," by Myles Standish, M. D., Boston.

The patient was a girl, fourteen years of age. Both parents were living and had never presented any evidence of syphilitic or tuberculous disease. Two brothers and one sister, all younger than the patient, are living and well. There is absolutely nothing of a specific character in the history of the patient or her brothers and sister. During the past winter she was confined to bed with intense pain in the epigastrium and ascites. Acute hepatitis was the diagnosis reached by the family physician. No pulmonary lesion was detected.

At the time she came under the observation of the speaker, she complained of feeling run down and was anaemic and poorly developed. The eye trouble had existed for four weeks. There had not been much pain or photophobia.

Examination of the eye, showed the iris attached by its pupillary margin to the capsule of the lens, and somewhat atrophied in appearance. On it there was a growth, 2 m. m. in diameter, pink in color, with small vessels on its surface. The growth projected from the iris near its ciliary border. Various mydriatics were employed without any effect upon the pupil.

In the course of a month the growth had doubled its size, the conjunctiva and iris remaining perfectly quiet. Other

growths made their appearance, and after consultation with Dr. Wadsworth, the eye was removed at the Massachusetts General Hospital.

Examination after enucleation, showed the vitreous, retina and choroid to be normal. The lens was somewhat opaque. The iris was very adherent to the capsule of the lens along its pupillary border, and also beneath the entire area of the principal growth. The largest mass sprang from the surface of the iris near its ciliary border, and at its base was 2.9 m. m. in diameter and was 2 m. m. in height. At the top its diameter was 4 m. m. This was apparently due to the pressure of the growth against the cornea. There were three other growths, but none of them involved the ciliary body, or even the ciliary border of the iris.

The microscopical examination, by Dr. Ernst, showed the presence of giant cells and of the bacillus tuberculosis.

Dr. Knapp had seen growths presenting exactly the same appearance which had disappeared under the use of specific treatment with mercury, even where there was no evidence of syphilis. He had never felt warranted in making the diagnosis of tubercle in such cases, although the presence of the tubercle bacilli in the case would seem to confirm the diagnosis.

"A Case of Congenital Coloboma of the Iris, Choroid, etc.," was reported by Dr. C. J. Kipp, Newark.

The patient was a woman 60 years of age. She was first seen four years ago. There were at that time no inflammatory symptoms, but a small triangular coloboma of the iris was found exactly in the vertical meridian. The tension was above normal. The patient had never seen with this eye, but it had never given pain. Four years later the patient was again seen and the eye presented the signs of inflammatory glaucoma; the pain had prevented sleep for many weeks. The eye was enucleated and healed promptly. There was also found a large ectasia of the sclerotic and over this the choroid and retina were wanting. The ectasia extended close to the optic papilla. There was also a deep kettle-shaped excavation of the optic nerve.

"Coloboma of the Choroid on the temporal side," by Dr. S. D. Risley, Philadelphia.

A young physician consulted Dr. R. for asthenopia. There was a considerable degree of myopia in the left eye. In the right eye vision was much diminished, $\frac{20}{1XXX}$. The ophthalmoscope showed a large hiatus in the choroid on the temporal side, the depth of which was 3 D. There had been no pain. The speaker thought that these cases were comparatively rare.

Dr. Mittendorf had seen several of these excavations in the outward direction. Where the coloboma was so deep it was, he thought, probably a coloboma of the optic nerve-sheath with excavation of the nerve. A difference of 4-D. would indicate a greater defect than would correspond to absence of choroid and retina alone.

"Serous Effusion in the Vitreous, due to Malaria," by W. W. Seely, Cincinnati.

The speaker considered the occurrence of this complication not infrequent, and he reported one case of this affection.

"Gray Degeneration of the Optic Nerve with Abnormal Patellar Reflex," by Wm. F. Norris, M. D.

After an elaborate review of the literature of the subject the speaker gave the result of his observation in cases in which the patella reflex was increased or diminished. He described three cases of gray degeneration associated with tabes dorsalis which had come under his observation. While he did not hold that this symptom indicated beginning tabes dorsalis, yet it was a danger signal calling for rest of the brain and cord with attention to improvement of the general condition.

"A Case of Double Optic Neuritis and Ophthalmoplegia from Lead Poisoning Complicated with Typhoid Fever," by Dr. O. F. Wadsworth, Boston.

A boy of nine years of age had suffered from obscure febrile symptoms for several weeks and movements of the left hand had been observed to be imperfect. When first seen by Dr. Wadsworth there was pronounced optic neuritis in both eyes, the rest of the fundus normal. Vision was much diminished. No lateral movements of left eye could be made and movement downward was impaired. The outward movement of right eye was defective. The probable diagnosis was tumor in the region of the pons.

The movements of the eyes became still more impaired and vision dark. The boy developed distinct symptoms of typhoid fever. The spleen and liver were both enlarged. Lead was found in the urine and the diagnosis of tumor was then abandoned. The treatment was iodide of potassium. The general condition gradually improved. The neuritis passed into atrophy, leaving too little vision to count fingers. The movements of the eyes were completely restored and the lead disappeared from the urine. The cause of the lead poisoning was found to be the presence of a piece of lead pipe in the cistern from which the drinking water was obtained.

"Oil Olive as a Menstrum for Dissolving Cocaine for Application to the Eye," by Dr. Joseph A. Andrews, New York.

In addition to the occasional benefit from the use of oil dropped into the eye in recent abrasions, burns, and in other painful affections of the cornea in which atropia is indicated, cocaine may likewise be serviceable. The plan of dissolving the cocaine in oil, seems to insure a longer contact of the remedy and a smaller quantity is required to effect anæsthesia two qualities of especial advantage in operations on the eye.

Neither the salt of cocaine nor of atropia is soluble in olive oil, but the alkaloid of both dissolves readily in the menstruum without the addition of an acid, it being only necessary to expose the solution for a few minutes to a gentle heat in a water bath. Castor-oil is not a desirable menstruum on account of its irritating qualities, and the oleate of cocaine for the same reason is still more objectionable as an application to the eye.

"A Case in Which Enucleation of one Eye for Glaucoma Had Precipitated Glaucoma in the Other Eye," by Dr. David Webster, New York.

The patient was a man of 54, the subject of glaucoma absolutum. He complained of periodical obscuration of vision in the good eye. $V = \frac{2}{3}V$ and there was no limitation of the visual field. As he was of dissipated habits he was advised to live properly. A week or two later he returned stating that he had had a worse attack. There was an excavation of the nerve detected in the good eye. The glaucomatous eye was now removed, two days later acute glaucoma appeared. An iridect-

omy was performed and he recovered in a week or two with $V = \frac{20}{xx}$, with no cupping of the disk and no limitation of the field. This was the only case he knew of in which enucleation has precipitated an attack of acute glaucoma in an eye already predisposed to it. He had however reported cases in which iridectomy had produced the same effect.

"Quinine Amaurosis," by Dr. E. Williams, Cincinnati.

The speaker reported two cases. In the first case a man took about one ounce in the course of four days. This produced total blindness and deafness, but in six weeks he could see as well as ever, the hearing had never completely returned although the quinine was taken eight years ago. The field of vision was concentrically contracted in both eyes. The optic discs were very white, the calibre of the arteries and veins was reduced and the smaller capillaries could not be seen.

The second case was that of a boy of 14 who had received large doses of quinine, the exact amount not being known. He was totally blind for four days. When examined the sight was much diminished and the atrophy of the optic disks was extreme and there was great contraction of the field of vision.

"A Means of Measurement of the Amount of Anesthesia From Cocaine," by Lucien Howe, Buffalo.

The doctor exhibited the drawing of a kymograph which he had used for this purpose. The use of the instrument was based on the fact that irritation of a sensory nerve is followed by a rise of blood pressure. The instrument is connected with an artery and the conjunctiva is irritated. Cocaine may then be applied and the results on the blood pressure be compared.

Dr. Harlan, Philadelphia, presented a modified ophthalmoscope which had been devised by Dr. Jackson, of Philadelphia. In it the lenses moved vertically instead of circularly.

Dr. Dennet, New York, exhibited an arrangement for using Stoke's lenses for measuring astigmatism and to avoid the inconvenience of constantly removing the frame from the patient's nose. The lenses were mounted on a stand and could thus be placed in front of the patient.

The society then went into executive session.

The election of officers for the following year resulted as follows:

President, Dr. Wm. F. Norris, Philadelphia.

Vice-President, Dr. Hasket Derby, Boston.

Secretary and Treasurer, Dr. O. F. Wadsworth, Boston.

Corresponding Secretary, Dr. J. C. Prout, Brooklyn.

New members were elected as follows:

Drs. Chas. A. Oliver, Philadelphia; Edward Jackson, Philadelphia; B. Alexander Randall, Philadelphia; D. Pope Walker, New York; William O. Moore, New York; Frank G. Capron, Providence; S. M. Burnett, Washington; Wm. T. Bacon, Hartford.

The next meeting will be held at New London the third Wednesday in July 1886.